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APR 22 1980

REF: 4SA-WG

*Preliminary Report on
Bluff Rd.*

Wagner
Joe Young
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Quentin C. Pair, Esq.
U.S.D.O.J.
Lands Division, Hazardous Waste Section
Penn. Avenue & 9th St. N.W.
Room 1535
Washington, D.C. 20350

Dear Mr. Pair:

As per your telephone request to Mike Carter on April 17, 1980, I am transmitting a copy of my report titled "Preliminary Report, Groundwater and Surface Water Investigation, South Carolina Recycling and Disposal, Inc., Bluff Road Site, Columbia, South Carolina, April 24, 1980." A final report will be prepared and transmitted as soon as all analyses have been completed and the data have been reviewed.

If you have any questions, please contact me at FTS/250-3300 or 250-3113.

Sincerely yours,

Hugh C. Vick
Environmental Scientist
Water Surveillance Branch

bcc: Carol Miller
Jim Scarbrough



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PRELIMINARY REPORT
GROUNDWATER AND SURFACE WATER INVESTIGATION
SOUTH CAROLINA RECYCLING AND DISPOSAL, INC.
BLUFF ROAD SITE
COLUMBIA, SOUTH CAROLINA
April 24, 1980

INTRODUCTION

An investigation of groundwater and surface water in the vicinity of South Carolina Recycling and Disposal's Bluff Road site was conducted by Messrs. Hugh Vick and Terry Smoak, U.S. Environmental Protection Agency, Surveillance and Analysis Division (SAD), Athens, Georgia, during March 17-18, 1980. In an attempt to determine the degree of actual contamination (if any) and/or potential contamination of both groundwater and surface water from this facility samples were collected from fourteen locations in and around the Bluff Road site.

DESCRIPTION OF STUDY AREA

The Bluff Road site is located on a slight rise in an otherwise low lying area near the river bottom land swamps of the Congaree River (see Figure I) near Columbia, South Carolina. In the past, the area northeast of Bluff Road was laced with a drainage ditch network to drain the swampy terrain (see Figure II). Figure III highlights the drainage ditch network. All waters collected by the ditch network pass under Bluff Road through two culverts and flow via two ditches into a tributary of the Congaree River. The surface of the shallow surficial groundwater aquifer is reportedly only two to three feet below the ground surface. Shallow groundwater apparently flows east or southeast to Myers Creek or south or southwest to the Congaree River swamp system.

When an acetylene manufacturing facility was originally constructed at this site, two lagoons were installed at the northeastern end of the facility. The dikes of the two lagoons were built over the main drainage ditch which roughly parallels Bluff Road, diverting swamp water flow around the northeast end of the site. Over the years the lagoon at the northern corner of the facility was filled with lime which is a waste product in the manufacture of acetylene. This information was furnished by Mr. James McClure, the present operator of the site.

As presently operated by South Carolina Recycling and Disposal, Inc., the Bluff Road site is used for the storage, recycling, and disposal of chemical wastes. Numerous instances of spillage of liquid waste and storage of dry chemicals directly on the ground surface as well as close proximity storage of incompatible chemicals have been reported by other investigators. This information is documented in an Affidavit by Rufus Jennings Bruner III, of this office, dated January 30, 1980.

During this investigation, the following items were noted:

- Drums of waste chemicals (acetone, ethyl alcohol, freon, and perchloroethylene) and empty one gallon jugs (formerly containing reagent grade trichloroethylene) were stored on the highway right-of-way between Bluff Road and the fence along the front of the facility (photographs 1 and 2). Information concerning the drum contents and the former contents of the jugs was noted from labels and confirmed by Mr. James McClure, the site operator.

- There were numerous examples of spillage and/or leaking drums in the drum storage area (photographs 3, 4, and 5).
- Chemical spillages exist in direct contact with water pooled in the old filled lagoon (photographs 6 and 7).
- There are two areas where what appears to be badly contaminated surface water drains directly to a swampy area adjoining the site (photographs 8, 11, and 12).
- Another point of potential runoff exists which could overflow after torrential rains (photograph 9). If dikes are built to prevent the runoff described in the above item, torrential rains would cause runoff at this point.
- Drums of zirconium tetrachloride stored near the lagoons have disintegrated. Part of this material has been re-drummed, but active zirconium tetrachloride is still exposed on the ground surface (photographs 6 and 7). Upon contact with water, this compound fumes, emitting HCl gas. On March 18, 1980, after heavy rains the previous night, the exposed material was fuming.
- The existing lagoon is in close proximity to the active drum storage area (photograph 10).
- Fencing along approximately one half the northwestern property line and all of the northeastern property line is either down or non-existent.

SAMPLING METHODOLOGY

General

An area reconnaissance was conducted on March 17, 1980. All samples were collected on March 18, 1980, by one of the SAD investigators (Mr. Hugh Vick or Mr. Terry Smoak). Mr. James McClure, President, South Carolina Recycling and Disposal, accompanied the SAD investigators during those portions of both the reconnaissance and sampling activities conducted at his facility. The SAD investigators were accompanied by Messrs. Tim Granata, Rick Grant, and Ted Buchanan, South Carolina Department of Health and Environmental Control, during sampling at all sites except the two on Myers Creek (MC-U and MC-D) and the upgradient well (CW-1).

Samples from the fourteen locations in and around the Bluff Road site included soil samples, surface water samples, sediment samples at surface water sampling sites and well water samples. All samples were transported to the SAD laboratory in Athens, Georgia, by the SAD investigators while maintaining proper chain of custody. Samples were collected for the following analyses in the designated containers with the indicated preservation.

AnalysisContainer; Preservation

Water

Volatile Organics
Extractable Organics
Metals

40 ml VOA vial^{*}; refrigerated
1 qt. glass^{**}; refrigerated
1 pt. glass^{*}; HNO₃ to pH<2;
refrigerated

Soil or Sediment

All analyses

1 qt. glass^{*}; refrigerated

* - New, solvent rinsed containers

** - New, acid rinsed containers

Figure I is an area map showing the location of the Bluff Road site and three of the sampling stations. Locations of the remainder of the sampling stations are shown on Figures III and IV. All sampling stations and types of samples collected at each are described on Table I.

Soil

Soil samples were collected with solvent rinsed stainless steel spoons directly onto new aluminum foil until enough sample was obtained to fill the sample container. The sampling spoon was used to thoroughly mix the sample before it was placed in the sample container.

Wells

All well pumps were operated until the conductivity of the effluent water stabilized. Water samples were then collected directly into the appropriate sample containers. The only exception was SCR-W (well at the Bluff Road site). This well is located in one of the buildings at this site containing numerous chemicals for reclamation. A bad leak in one of the water pipes in the building precluded operating the pump for over ten minutes. Even though two conductivity readings taken five minutes apart indicated a stable conductivity, it is not known if continued pumping would have changed the conductivity. The well had not been used for approximately one year and required priming before it would operate. While an employee of South Carolina Recycling and Disposal, Inc., was carrying the third or fourth gallon of water to prime the well, the investigators noticed that he was hauling the water in one of the empty jugs from the front of the facility which originally contained trichloroethylene. Therefore, the analytical results from this well may be suspect.

Surface Drainage Sites

- Sediment - Sediment samples were collected with solvent rinsed stainless steel spoons directly onto new aluminum foil until enough sample was obtained to fill the sample container. The sampling spoon was used to thoroughly mix the sample before it was placed in the sample container.
- Water - These samples were collected directly into the appropriate sample containers.

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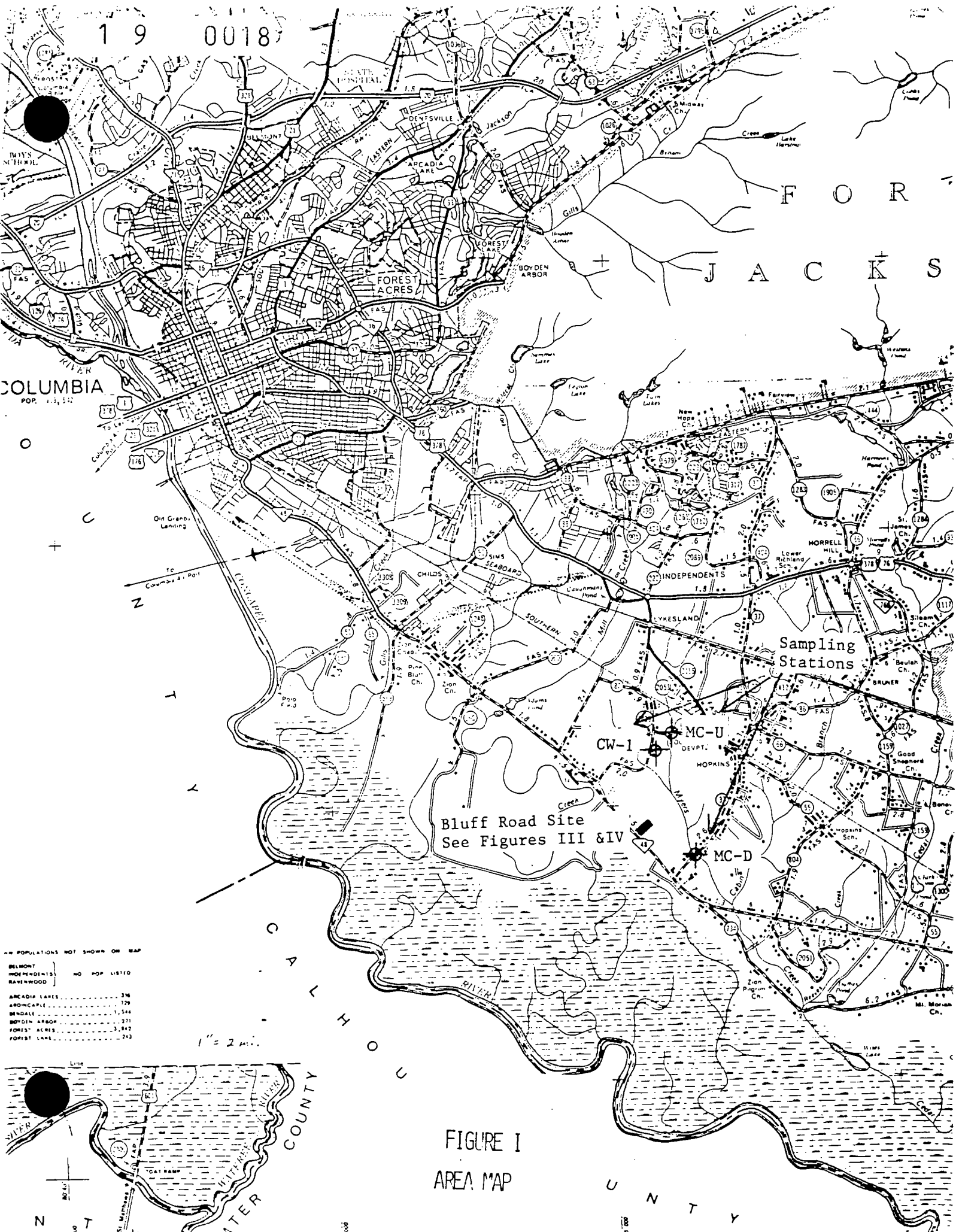
ANALYTICAL METHODOLOGY

All water samples for volatile and extractable organic analyses were shipped to a contract laboratory for analysis. All analyses on soil and sediment samples plus metal analyses on the water samples were performed at the SAD Laboratory in Athens, Georgia.

TABLE I
SAMPLE TYPE AND LOCATION DESCRIPTION
SOUTH CAROLINA RECYCLING AND DISPOSAL, INC.
BLUFF ROAD SITE
COLUMBIA, SOUTH CAROLINA

SCR-1	Soil sample from entrance road
SCR-2	Soil sample from spillage area in drum storage yard
SCR-3	Soil sample from spillage area in drum storage yard
SCR-4	Soil sample from spillage area in drum storage yard
RO-1	Water and sediment samples at overflow to swampy area from northeast corner of existing laboon
RO-2	Water and sediment samples at overflow to swampy area from pooled area at northern corner of old lagoon
RO-3	Water and sediment samples from swampy area near point of potential runoff from pooled area in northeastern end of old lagoon
CG-1	Water sample from well at Campbell & Sons Garage and Junk Yard. Well is of unknown depth but was estimated to be 45-50 feet deep by a representative of the South Carolina Department of Health and Environmental Control
CW-1	Water sample from 90 feet deep well of Thomas Kirkland which is assumed to be upgradient of the Bluff Road site
SCR-W	Water sample from well of unknown depth at the Bluff Road site
DD-1	Water and sediment samples from drainage ditch southwest of Bluff Road and south of the Bluff Road site
DD-2	Water and sediment samples from drainage ditch southwest of Bluff Road and northwest of the Bluff Road site
MC-U	Water and sediment samples from Myers Creek at State Road 1571
MC-D	Water and sediment samples from Myers Creek at State Road 37

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ALL POPULATIONS NOT SHOWN ON MAP

POPULATION	NO. POP. LISTED
BELMONT	
INDEPENDENTS	
RAVENWOOD	
ARCADIA LAKES	376
AROMCABLE	129
BENDALE	1,544
BOYDEN ARBOR	271
FOREST ACRES	3,842
FOREST LAKES	242

FIGURE I
AREA MAP

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An aerial photograph showing a dark, textured landscape. A light-colored road or path runs diagonally from the upper left towards the center. A horizontal road or boundary line crosses the middle of the image. Below this line, on the left side, is a bright, rectangular structure that appears to be a building or a large shed. The overall image is grainy and has high contrast.

FIGURE II
AERIAL PHOTOGRAPH OF APEA

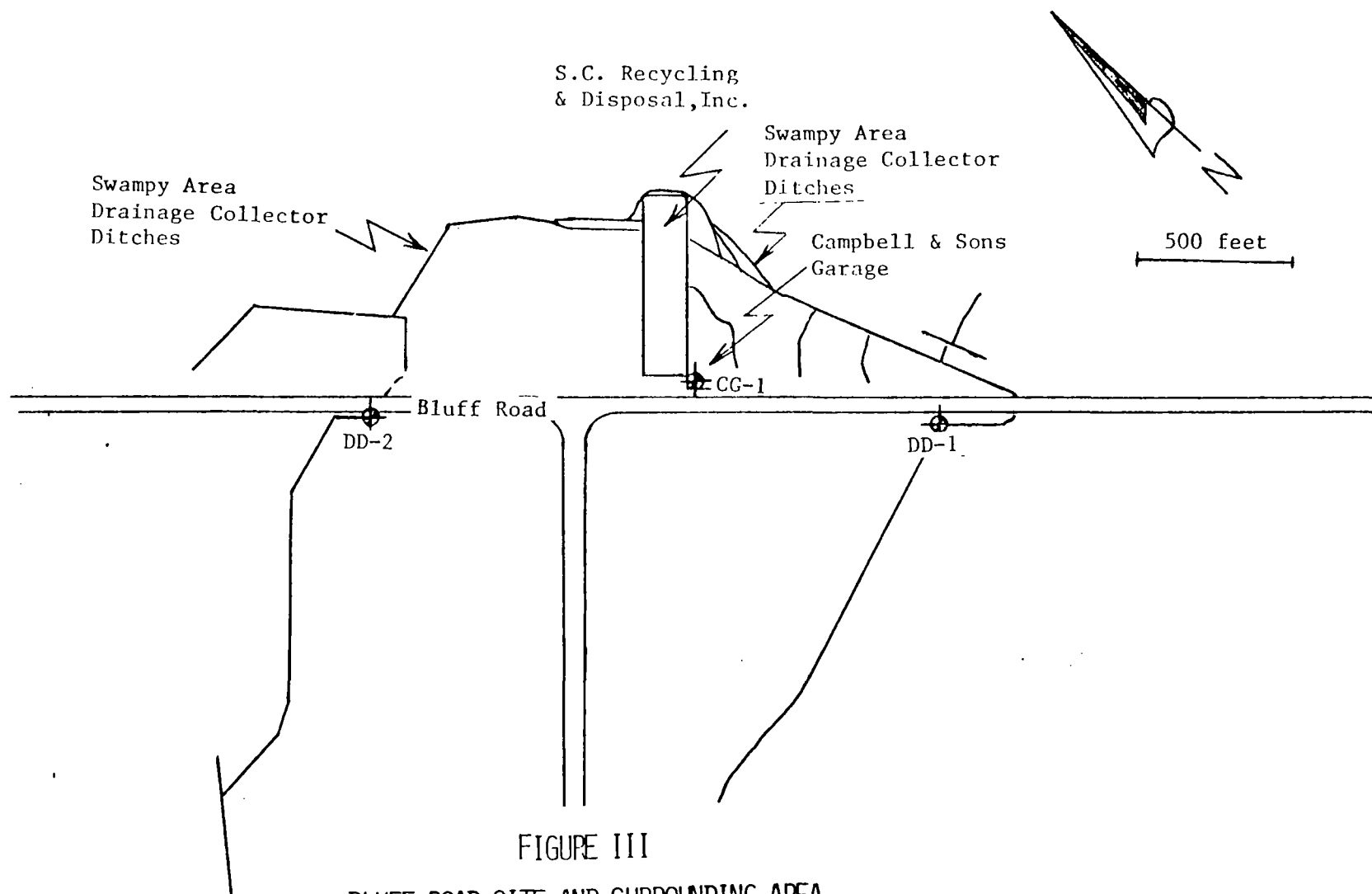


FIGURE III
BLUFF ROAD SITE AND SURROUNDING AREA
SOUTH CAROLINA RECYCLING AND DISPOSAL, INC.
COLUMBIA, S.C.

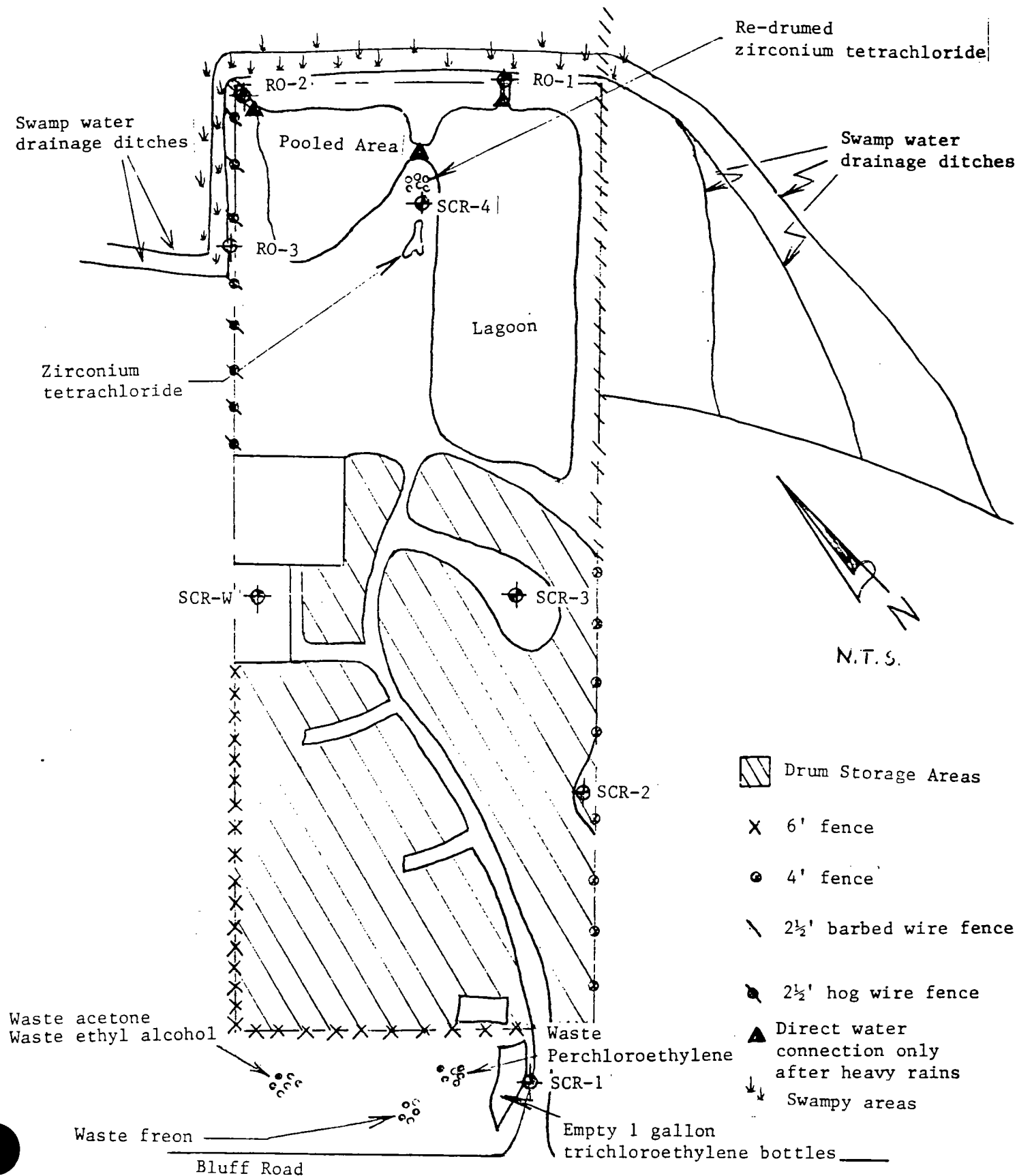


Figure IV
Schematic Drawing
South Carolina Recycling and Disposas, Inc.
Bluff Road Site
Columbia, S.C.



No. 1-Drums stored along the highway right-of-way between Bluff Road and the fence at South Carolina Recycling and Disposal, Inc. Drums in the foreground reportedly contain waste freon. These in the left background reportedl contain waste acetone and waste ethyl alcohol while those in the right background reportedly contain perchlor-ethylene.



No. 2-Empty, one gallon jugs which once contained reagent grade trichlor-ethylene. These jugs are piled on the highway right-of-way between Bluff Road and the fence at South Carolina Recycling and Disposal, Inc.

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No. 3-Contaminated soil at South Carolina Recycling and Disposal, Inc. resulting from spillage and/or leaking drums (sampling site SCR-3).



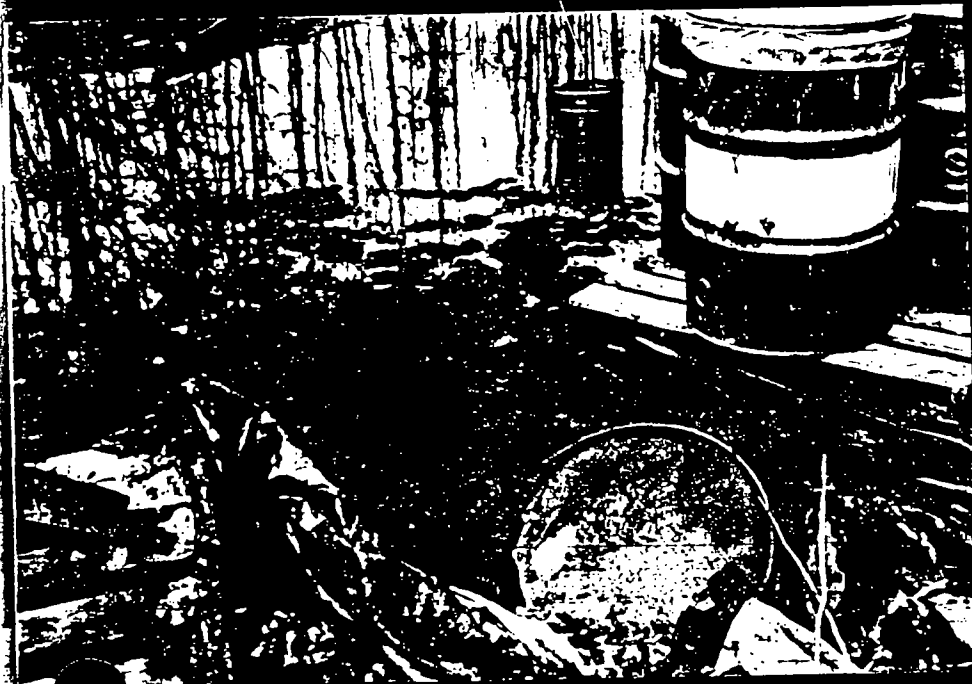
No. 4-Leaking drums near sampling site SCR-3.



No. 5-Pooled water in drum storage area near fence between South Carolina Recycling and Disposal, Inc. and Campbell and Sons Garage (sampling site SCR-2).



No. 6-Zirconium tetrachloride (blackish material) mixed with disintegrated drums and other debris at the edge of a pooled area in an old filled lagoon at the northern corner of facility (sampling site SCR-4). Re-drummed zirconium tetrachloride can be seen in the background.



No. 7-Close-up of black, oily sludge shown in background of above photograph.



No. 8-Pooled area in an old filled lagoon at the northern corner of facility. Direct runoff from this area to the local swamp-water drainage ditch system occurs near the middle of the photograph at the curve in the low dike (sampling site RO-2).



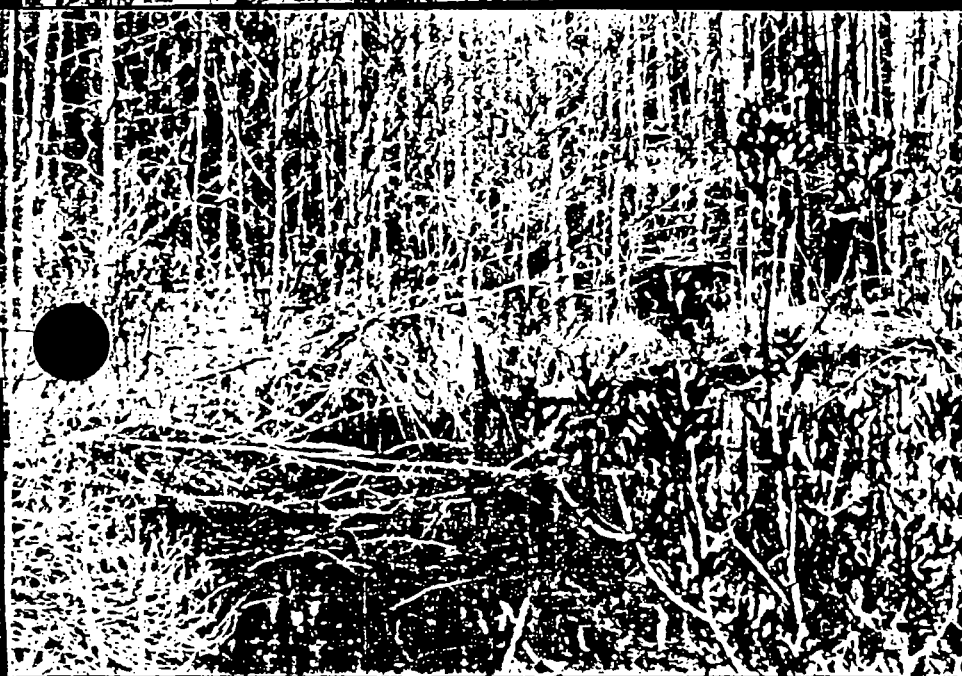
No. 9-Point of potential runoff from north western corner of pooled area shown in above photograph. Part of the swamp-water drainage collector ditch system can be seen in the background (sampling site RO-1).

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No. 10-Existing lagoon at eastern corner of facility showing proximity of lagoon to drum storage area.



No. 11-Northeastern end of lagoon shown in above photograph. Direct runoff from the lagoon to the swamp-water drainage collector ditch system occurs near the middle of the photograph.



No. 12 - Close-up of drainage from lagoon shown in the above photograph (sampling site RO-3).